REMARKS

This is in response to the Office Action mailed 8/20/2007. Minor amendments to claims 27-30 and 32 have been made to correct typographical errors with respect to dependency. Such amendments have been made without adding new matter. Reconsideration of this application is respectfully requested in view of this response/amendment.

STATUS OF CLAIMS

Claims 26-49 are pending.

Claims 26-32, 34-45 and 47-49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ganesh et al. (US6957236) in view of Odom et al. (US6516320) and further in view of Najork et al. (US7007027).

Claims 33 and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ganesh et al. in view of Odom et al. and further in view of Najork et al. and further in view of Chang et al. (US6584459).

OVERVIEW OF CLAIMED INVENTION

The present invention provides for a computer-based method to ***version a node rage*** and *locate a versioned node range* in a storage architecture managing node ranges, wherein the computer-based method comprises the steps of: (a) receiving a node modification request (e.g., a node deletion request, a node insertion request, a node modification request, etc.) ***for a node range*** from a database system; (b) versioning said node range by copying, to a storage, a node range to which said node modification request is to be made and ***labeling said copied node range*** with an identifier; (c) ***locating said labeled node range via said identifier*** (e.g., ***timestamp***

or ***Log Sequence Number***) ***and a hash on said node range***; and (d) outputting said located

labeled node range.

The present invention also provides for a computer-based <u>method to **version a node**</u>

range and to ***locate a versioned node range*** <u>in a storage architecture managing node ranges via a</u>

<u>node id range index</u>, said each node assigned a <u>node id value</u> and a <u>set of nodes forming a node</u>

<u>range</u>, <u>each entry in said node id range index pointing to a node range and its range identifier</u>,

RID, said computer-based method implemented in computer readable program code stored in

computer memory, said method comprising the steps of: (a) <u>receiving a node modification</u>

<u>request</u> (e.g., a node deletion request, a node insertion request, a node modification request, etc.)

for a range; (b) <u>versioning said **range** associated with said node modification request by</u>

shadowing nodes in said range <u>to a</u> ***Version Hash Table based on RID and assigning a time***

identifier to copies of said range; (c) ***locating a node in said shadowed range via said time***

identifier and RIDs; and (d) outputting said located node range.

New readers, after a modification, access current nodes through a new RID and old

readers access old nodes via the same RID, with the shadowed copy being locatable in said

Version Hash Table by hashing the same RID.

In one embodiment, when modifications cause nodes in a range to be moved to a new

RID, previous readers are redirected from the new RID to the old RID via a Redirection Hash

Table. In another embodiment, when modifications cause nodes in a range to be moved to a new

RID, previous readers are redirected from the new RID to the old RID via an index that describes

where old versions are in said Version Hash Table. In another embodiment, for range deletions, the range being deleted is moved to reserved RID RIDFF.

The present invention also provides computer medium carrying computer readable program code implementing the above-described methods.

REJECTIONS UNDER 35 U.S.C. §103(a)

Claims 26-32, 34-45 and 47-49 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ganesh et al. (US 6,957,236), hereafter Ganesh, in view of Odom et al. (US 6,516,320), hereafter Odom, and further in view of Najork et al. (US 7,007,027), hereafter Najork. To be properly rejected under 35 U.S.C. § 103(a), the cited references have to provide for each and every element of the rejected claims. Applicants respectfully submit that the combination of the Ganesh, Odom and Najork fail to teach or suggest many of the features of the rejected claims.

Ganesh teaches a computer-implemented method for providing a data item to a transaction, wherein the method comprises the steps of: (a) locating, within volatile memory, a first version of a data block that includes a first version of the data item; (b) determining whether the first version of the data item is usable by the transaction without respect to whether the first version of the data block is useable by the transaction; (c) if the first version of the data item is usable by the transaction, then establishing said data item as a candidate that can be provided to the transaction; and (d) if the first version of the data item is not useable by the transaction, then

obtaining a version of the data item that is usable by the transaction from a second version of the data block that is different from said first version.

Odom teaches tiered hashing for data access wherein a memory for access by a program being executed includes a data access structure stored in memory, the data access structure including a first and second index structure together forming a tiered index. According to Odom, at least one entry in the first structure indicates an entry in the second structure.

Najork teaches a database comprising a B-Tree data structure having a plurality of nodes associated with disk blocks and handles stored in said nodes and a mechanism for performing a lookup operation with respect to a key, k, wherein, in traversing the B-Tree at a given node, the lookup operation refers to a left-link handle, h_{left}, of that node to access a left sibling of the node if the key k is less than or equal to a value K_{min} stored in the node.

With respect to independent claim 26, Applicants agree with the Examiner's conclusion on page 4 of the Office Action of 08/20/2007 that Ganesh and Odom fail to disclose, explicitly or implicitly, a storage architecture managing ***node ranges***. However, Applicants respectfully disagree with the Examiner's assertion on page 4 of the Office Action of 08/20/2007 that such node ranges are taught for by Najork. For support of such an assertion, the Examiner points to column 2, lines 28-42 of Najork as teaching such a feature. The relevant citation from the Examiner's citation is provided below:

"A mechanism for performing a lookup operation with respect to a key, k, traverses the B-Tree and refers to the left-link handle, h_{left}, of a node to access a left sibling of the node if the key k is less than or equal to a value k_{min} stored in the node. Mechanisms are also provided for performing insert and delete operations, and the lookup, insert, and delete operations detect if the ***key range of an index node***, A, does not-include the key k that the operation is trying to locate, and follow a handle $A.h_{left}$ to the left sibling when $k \leq A.k_{min}$." (emphasis added).

Applicants respectfully note that the Examiner's citation and the entire Najork reference merely teach a "**key range**" and makes no explicit or implicit mention of a "**node ranges**". Applicants respectfully assert that a "**key range**" cannot be equated to a "**node range**".

Since Ganesh, Odom, or Najork fail to teach or suggest the management of **node ranges**, it also follows that the same combination of references also fail to teach or suggest the **versioning** of such **node ranges** and **labeling** a copied versioned node range with an **identifier**.

Further, since Ganesh, Odom, or Najork fail to teach or suggest the management of **node ranges**, it also follows that the same combination of references also fail to teach or suggest the step of **locating a labeled node range via an identifier**, such as a timestamp or log sequence number, **and a hash on a node range**.

Absent such teachings, Ganesh, Odom, and Najork cannot render obvious Applicants' independent claim 26. Applicants, therefore, respectfully request the Examiner to withdraw the

35 U.S.C §103 rejection with regards to pending claim 26 and respectfully request allowance thereof.

With respect to independent claim 34, Applicants agree with the Examiner's conclusion on page 7 of the Office Action of 08/20/2007 that Ganesh and Odom fail to disclose, explicitly or implicitly, a <u>storage architecture managing **node ranges**</u>. However, Applicants respectfully disagree with the Examiner's assertion on page 7 of the Office Action of 08/20/2007 that such node ranges are taught for by Najork. As mentioned in the argument of independent claim 26, Applicants respectfully note that the Examiner's citation and the entire Najork reference merely teach a "**key range**" and makes no explicit or implicit mention either a "**node range**" or an associated "**range identifier, RID**".

Since Ganesh, Odom, or Najork fail to teach or suggest a "**node range**" or a "**range identifier, RID**", it also follows that the same combination of references also fail to teach or suggest independent claim 34's feature of <u>versioning a **range associated with said node modification request**</u> by **shadowing nodes in said range** to a **Version Hash Table** based on **RID** and <u>assigning a **time identifier**</u> to copies of said range, wherein the **shadowed range** <u>is located via said **time identifier and RIDs**</u>;

Since Ganesh, Odom, or Najork fail to teach or suggest a "**node range**" or a "**range identifier, RID**", it also follows that the same combination of references also fail to teach or suggest independent claim 34's feature of **locating a node in a shadowed range via a time identifier and RIDs**.

Further, with respect to pending claim 34's feature of "shadowing nodes in said range to a Version Hash Table based on RID", the Examiner cites column 4, lines 61-65 of the Ganesh reference as teaching such a feature. This citation merely describes a situation **wherein updates are made to a copy of a data block to create a new version**. Conspicuously absent in the above citation is a teaching or suggestion for ***node ranges*** or a teaching or suggestion for ***shadowing nodes*** in said range to a ***Version Hash Table based on RID***. Applicants maintain that there is neither an explicit nor an implicit mention in Ganesh for shadowing nodes or shadowing nodes in a node range to a table based on RID. Applicants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 34's features as asserted by the Examiner.

Further, with respect to pending claim 34's feature of "assigning a time identifier to copies of said range; wherein a node in said shadowed range is locatable via said time identifier and RIDs", the Examiner cites column 4, lines 41-54 of the Ganesh reference as teaching such a feature. As mentioned earlier, Column 4, lines 41-54 of the Ganesh merely addresses time parameters such as **INCLUDE TIME** and **EXCLUDE TIME** and cannot be equated to Applicants' step of **assigning a time identifier to copies of said range; wherein a node in said shadowed range is locatable via said time identifier and RIDs**. Applicants, therefore, respectfully contend that the Ganesh reference fails to teach or suggest claim 34's features as asserted by the Examiner.

Absent such teachings, Ganesh, Odom, and Najork cannot render obvious Applicants' independent claim 34. Applicants, therefore, respectfully request the Examiner to withdraw the 35 U.S.C §103 rejection with regards to pending claim 34 and respectfully request allowance thereof.

Arguments presented above with respect to independent claims 26 and 34 substantially apply to independent claims 48 and 49. At least for the reasons presented above, Applicants respectfully assert that Ganesh, Odom, and Najork cannot render obvious Applicants' independent claims 48 and 49. Applicants, therefore, respectfully request the Examiner to withdraw the 35 U.S.C §103 rejection with regards to pending claims 48 and 49 and respectfully request allowance thereof.

The above-presented arguments with regards to independent claims 26 and 34 substantially apply to dependent claims 27-32 and 35-45 as they inherit all the features of the claim from which they depend. Applicants, therefore, respectfully request the Examiner to withdraw the 35 U.S.C §103 rejection with regards to pending dependent claims 27-32 and 35-45 and respectfully request allowance thereof.

Claims 33 and 46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ganesh in view of Odom and further in view of Najork and further in view of Chang et al. (US 6,584,459), hereafter Chang. To be properly rejected under 35 U.S.C. §103(a), the cited references have to provide for each and every element of the rejected claims. Applicants

respectfully submit that the combination of the Ganesh, Odom, Najork and Chang fail to teach or suggest many of the features of claims 33 and 46.

Chang merely teaches an extender for a relational database system that includes indexing of structured documents with general and rich data types, querying structured documents using a conditional select function; and creating structure indexes using a tag counting system.

However, Chang fails to remedy the shortcomings of the Ganesh, Odom, and Najork references. Specifically, since Ganesh, Odom, or Najork fail to teach or suggest a "node range", it also follows that the same combination of references also fail to teach or suggest such **node ranges being associated with hierarchical node data derived from an XML document**.

Therefore, at least for the reasons set forth above, Applicants respectfully assert that the combination of the Ganesh, Odom, Najork and Chang cannot render obvious the features of dependent claims 33 and 46. Applicants, therefore, respectfully request the Examiner to withdraw the 35 U.S.C §103 rejection with regards to pending dependent claims 33 and 46 and respectfully request allowance thereof.

SUMMARY

As has been detailed above, none of the references, cited or applied, provide for the specific claimed details of Applicants' presently claimed invention, nor renders them obvious. It is believed that this case is in condition for allowance and reconsideration thereof and early issuance is respectfully requested.

As this response has been timely filed, no request for extension of time or associated fee is required. However, the Commissioner is hereby authorized to charge any deficiencies in the fees provided to Deposit Account No. 09-0460.

If it is felt that an interview would expedite prosecution of this application, please do not hesitate to contact Applicants' representative at the below number.

Respectfully submitted,

/ramraj soundararajan/

Ramraj Soundararajan
Registration No. 53,832

IP Authority, LLC.
4821A Eisenhower Ave
Alexandria, VA 22304
(703) 461-7060

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